

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent Application

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Applicant(s): Zulfiqar Sayeed

Case: 18

Serial No.: 09/826,399

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Group: 2634

Examiner: Ted M. Wang

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Title: Method and Apparatus for Adjusting the Gain of an IF Amplifier in a Communication System

CORRECTED APPEAL BRIEF

20 Mail Stop Appeal Brief - Patents

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

25 Sir:

Appellants hereby submit this corrected Appeal Brief to conform to the current format requirements. The original Appeal Brief was submitted on October 28, 2005 to appeal the final rejection dated April 21, 2005, of claims 1 through 9 of the above-identified patent 30 application.

REAL PARTY IN INTEREST

The present application is assigned to Agere Systems Inc., as evidenced by an assignment recorded on April 3, 2001 in the United States Patent and Trademark Office at Reel 35 011695, Frame 0890, and by an assignment under 37 CFR 3.73(b) dated April 16, 2003. The assignee, Agere Systems Inc., is the real party in interest.

RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

STATUS OF CLAIMS

Claims 1 through 17 are presently pending in the above-identified patent application. Claim 1 remains rejected under 35 U.S.C. §102(e) as being anticipated by Earls et al. (United States Patent Number 6,532,358). Claims 2, 4, and 6 remain rejected under 35 U.S.C. §103(a) as being unpatentable over Earls et al. in view of Okamoto (United States Patent Number 6,614,855), claim 3 remains rejected under 35 U.S.C. §103(a) as being unpatentable over Earls et al. in view of Marchok et al. (United States Patent Number 5,790,514), and claim 9 remains rejected under 35 U.S.C. §103(a) as being unpatentable over Earls et al. in view of Okamoto, and further in view of Baldwin et al. (United States Patent Number 6,735,422). The Examiner indicated that claims 5, 7, and 8 would be allowable if rewritten in independent form including all of the limitations of the base claims and any intervening claims, and that claims 10-17 are allowed. Claims 1 and 4 are being appealed.

STATUS OF AMENDMENTS

15 There have been no amendments filed subsequent to the final rejection.

SUMMARY OF CLAIMED SUBJECT MATTER

Independent claim 1 is directed to, in a communication receiver (FIG. 2: 200), a method for adjusting the gain (FIG. 2: 1000) of an IF amplifier (FIG. 2: 225), the method comprising the steps of: monitoring a gain adjustment of an RF amplifier (FIG. 2: 210) in the communication receiver (FIG. 2: 200; page 6, lines 5-13); and adjusting the IF gain value based on the monitored RF amplifier gain adjustment by an amount approximately opposite to the RF gain value (FIG. 10: 1020; page 6, lines 14-22).

Claim 4 requires adjusting the IF gain value based on at least one signal energy measurement performed before or after a fast Fourier transform (FFT) stage in the receiver in order to maintain a desired set point if there is no RF gain adjustment (page 20, lines 1-20).

Independent claim 10 is directed to, in a communication receiver (FIG. 2: 200), a method for adjusting the gain (FIG. 2: 1000) of an IF amplifier (FIG. 2: 225), the method comprising the steps of: monitoring signal energy measurements before and after a fast Fourier transform (FFT) stage (FIG. 3: 325) in the receiver in order to maintain a corresponding set point

(page 6, lines 5-13; page 20, lines 1-20); establishing corresponding thresholds for each of the signal energy measurements (page 6, lines 17-19; page 20, lines 1-30); and adjusting the IF gain value by an amount based on the signal energy measurements before and after the FFT stage and the corresponding thresholds (page 6, lines 5-22; page 20, lines 1-30).

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STATEMENT OF GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claim 1 is rejected under 35 U.S.C. §102(e) as being anticipated by Earls et al. Claims 2, 4, and 6 are rejected under 35 U.S.C. §103(a) as being unpatentable over Earls et al. in view of Okamoto.

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ARGUMENT

Independent Claim 1

Independent claim 1 was rejected under 35 U.S.C. §102(e) as being anticipated by Earls et al.

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Regarding claim 1, the Examiner asserts that Earls discloses adjusting said IF gain value (FIG. 1, element 22, and col. 3, lines 1-42) based on said monitored RF amplifier gain adjustment (FIG. 1, elements 14, 22, 26, 28, and 30; FIG. 3; and col. 3, line 17, to col. 4, line 4) by an amount approximately opposite to said RF gain value (FIG. 1, elements 24 and 30; and col. 3, line 1, to col. 4, line 4).

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Applicant notes that, in the text cited by the Examiner, Earls teaches that the gains (IF and Wideband) are set during three specific steps (see, FIG. 3). Regarding the first step (entitled “SET WIDEBAND GAIN”), Earls teaches that

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the controller 30 reads the output from the wideband detector 26, 28 and *sets a gain control value for the wideband variable gain input amplifier 14 in order to provide a nominal amplitude of the RF signal to the mixer stage 18.* (Col. 3, lines 38-42.)

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Regarding the second step (entitled “SET IF GAIN”), Earls teaches that

the controller 30 reads the output from the IF detector 24 and *sets a gain control value for the IF amplifier 22 to provide a maximum amplitude value for the IF signal to put it close to full scale for the analog-to-digital converter (A/D) in the IF detector.* (Col. 3, lines 43-47.)

Regarding the third step (entitled “RE-OPTIMIZE WB AND IF GAINS”), Earls teaches that

5 the respective gains of the wideband and IF amplifiers may be re-optimized by *increasing the IF gain by the specified dBm and decreasing the wideband gain by the specified dBm.*

(Col. 3, lines 59-62.)

10 Earls, however, does not disclose or suggest adjusting an IF gain value based on a monitored RF amplifier gain adjustment *by an amount approximately opposite to the RF gain value.* Independent claim 1, as amended, requires “adjusting said IF gain value **based on said monitored RF amplifier gain adjustment by an amount approximately opposite to said RF gain value.”**

Thus, Earls et al. do not disclose or suggest adjusting said IF gain value based on said monitored RF amplifier gain adjustment by an amount approximately opposite to said RF gain value, as required by independent claim 1.

15 Additional Cited References

Okamoto was also cited by the Examiner for its disclosure of a receiver for receiving broadcasting signals with an OFDM communication receiver. Okamoto does not disclose or suggest, however, adjusting an IF gain value based on an RF gain adjustment.

20 Thus, Okamoto does not disclose or suggest adjusting said IF gain value based on said monitored RF amplifier gain adjustment by an amount approximately opposite to said RF gain value, as required by independent claim 1.

Marchok et al. were also cited by the Examiner for its disclosure of a receiver for receiving broadcasting signals with a DMT communication receiver. Marchok does not disclose or suggest, however, adjusting an IF gain value based on an RF gain adjustment.

25 Thus, Marchok et al. do not disclose or suggest adjusting said IF gain value based on said monitored RF amplifier gain adjustment by an amount approximately opposite to said RF gain value, as required by independent claim 1.

Baldwin et al. was also cited by the Examiner for its disclosure of a threshold for said signal energy measurement (that) is established to prevent clipping. Baldwin et al. does not 30 disclose or suggest, however, adjusting an IF gain value based on an RF gain adjustment.

Thus, Baldwin et al. do not disclose or suggest adjusting said IF gain value based on said monitored RF amplifier gain adjustment by an amount approximately opposite to said RF gain value, as required by independent claim 1.

Claim 4

5 Claim 4 was rejected under 35 U.S.C. §103(a) as being unpatentable over Earls et al. in view of Okamoto. In particular, the Examiner asserts that Okamoto discloses adjusting said IF gain value (FIG. 2: element SSG) based on at least one signal energy measurement (FIG. 2: element 29 and col. 6, lines 40-50) performed before or after a fast Fourier transform (FFT) stage in said receiver in order to maintain a desired set point.

10 Applicant notes that Okamoto, however, does not disclose or suggest adjusting an IF gain value based on at least one signal energy measurement performed before or after a fast Fourier transform (FFT) stage in a receiver *in order to maintain a desired set point if there is no RF gain adjustment*. Claim 4 requires adjusting said IF gain value based on at least one signal energy measurement performed before or after a fast Fourier transform (FFT) stage in said 15 receiver *in order to maintain a desired set point if there is no RF gain adjustment*.

Thus, Earls et al., Okamoto, Marchok et al., and Baldwin et al., alone or in any combination, do not disclose or suggest adjusting said IF gain value based on at least one signal energy measurement performed before or after a fast Fourier transform (FFT) stage in said receiver in order to maintain a desired set point if there is no RF gain adjustment, as required by 20 claim 4.

Conclusion

The rejections of the cited claims under section 102 and 103 in view of Earls et al., Okamoto, Marchok et al., and Baldwin et al., alone or in any combination, are therefore 25 believed to be improper and should be withdrawn. The Examiner has already indicated that claims 5, 7, and 8 would be allowable if rewritten in independent form including all of the limitations of the base claims and any intervening claims, and that claims 10-17 are allowed. The remaining rejected dependent claims are believed allowable for at least the reasons identified above with respect to the independent claims.

The attention of the Examiner and the Appeal Board to this matter is appreciated.

Respectfully,

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APPENDIX

1. In a communication receiver, a method for adjusting the gain of an IF amplifier, said method comprising the steps of:

5 monitoring a gain adjustment of an RF amplifier in said communication receiver; and

adjusting said IF gain value based on said monitored RF amplifier gain adjustment by an amount approximately opposite to said RF gain value.

10 2. The method according to claim 1, wherein said communication receiver is an OFDM communication receiver.

3. The method according to claim 1, wherein said communication receiver is a DMT communication receiver.

15 4. The method according to claim 1, further comprising the step of adjusting said IF gain value based on at least one signal energy measurement performed before or after a fast Fourier transform (FFT) stage in said receiver in order to maintain a desired set point if there is no RF gain adjustment.

20 5. The method according to claim 4, wherein said signal energy measurement is a sum over n values of the squares of the real and imaginary portions of signal samples, where n corresponds to an inverse of an update rate (UR).

25 6. The method according to claim 4, wherein said signal energy measurement is performed before said FFT stage and wherein said method further comprises the step of adjusting said IF gain value in stepped increments if a difference between said signal energy measurement and a corresponding pre-FFT threshold are within a predefined tolerance

7. The method according to claim 4, wherein said signal energy measurements are performed before and after said FFT stage and wherein said method further comprises the step of adjusting said IF gain value by an amount equal to a minimum of a difference between a pre-signal energy measurement and a corresponding pre-FFT threshold and a difference between a post-signal energy measurement and a corresponding post-FFT threshold multiplied by a constant.

8. The method according to claim 4, wherein a threshold for said signal energy measurement is established to maximize a number of bits representing each sample.

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9. The method according to claim 4, wherein a threshold for said signal energy measurement is established to prevent clipping.

10. In a communication receiver, a method for adjusting the gain of an IF amplifier, said method comprising the steps of:

monitoring signal energy measurements before and after a fast Fourier transform (FFT) stage in said receiver in order to maintain a corresponding set point;

establishing corresponding thresholds for each of said signal energy measurements; and

20 adjusting said IF gain value by an amount based on said signal energy measurements before and after said FFT stage and said corresponding thresholds.

11. The method according to claim 10, wherein said communication receiver is an OFDM communication receiver.

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12. The method according to claim 10, wherein said communication receiver is a DMT communication receiver.

13. The method according to claim 10, wherein said signal energy measurements are a sum over n values of the squares of the real and imaginary portions of signal samples, where n corresponds to an inverse of an update rate (UR)

5 14. The method according to claim 10, further comprising the step of adjusting said IF gain value in stepped increments if a difference between said signal energy measurement performed before said FFT stage and a corresponding pre-FFT threshold are within a predefined tolerance.

10 15. The method according to claim 10, wherein said thresholds are established to maximize a number of bits representing each sample

16. The method according to claim 10, wherein said thresholds are established to prevent clipping.

15 17. The method according to claim 10, wherein said adjusting step further comprises the step of selecting a minimum of a difference between said signal energy measurement before said FFT stage and said corresponding threshold and a difference between said signal energy measurement after said FFT stage and said corresponding threshold.

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EVIDENCE APPENDIX

There is no evidence submitted pursuant to § 1130, 1.131, or 1.132 or entered by the Examiner and relied upon by appellant.

RELATED PROCEEDINGS APPENDIX

There are no known decisions rendered by a court or the Board in any proceeding identified pursuant to paragraph (c)(1)(ii) of 37 CFR 41.37.